



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,185	12/18/2000	Takayuki Araki	P06971US00/L	2588

881 7590 09/23/2005  
STITES & HARBISON PLLC  
1199 NORTH FAIRFAX STREET  
SUITE 900  
ALEXANDRIA, VA 22314

EXAMINER

RUTHKOSKY, MARK

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/700,185

Applicant(s)

ARAKI ET AL.

Examiner

Mark Ruthkosky

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,5-30 and 32-44 is/are pending in the application.
- 4a) Of the above claim(s) 1,5-29,37 and 41-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30,32-36 and 38-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 32-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The instant claims are to a material that comprises a multi-segmented block copolymer containing at least two types of fluoropolymer chain segments (A and B) differing in monomer composition, with at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups (chain segment A as defined in claim 32.) The dependent claims 32-34 state that chain segment A includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups. The unit (b) in claim 32 is defined to be the same as the segment B of claim 30. From this, the claims are indefinite as it is not clear in the polymer where one block begins and ends. For example, a block of subunits (B-B-B-B-B-B-b-b-b-b-b-b-b) is indefinite as B=b and it is not clear which elements belong to which segment or unit. Claims 33-34 depend from claim 32.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1745

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

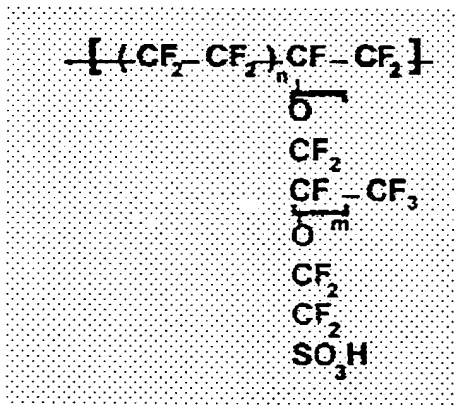
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 30, 32-36 and 38-40 are rejected under 35 U.S.C. 102(e) as being anticipated by

Cisar (US 6,492,431.)

The instant claims are to a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups.

Cisar (US 6,492,431) teaches a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups.

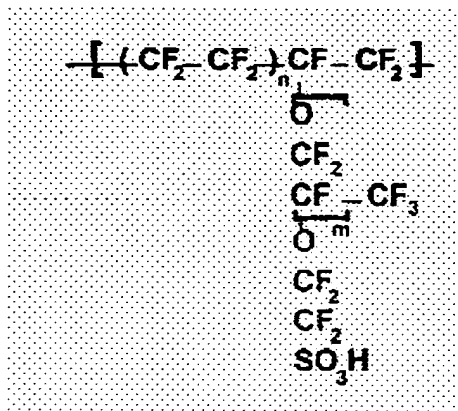


Art Unit: 1745

One segment block contains polytetrafluoroethylene groups (PTFE) and another segment block contains perfluorovinyl ester with sulfonic acid functional groups. The crystalline melting point is over 300 C. The perfluorovinyl ester with sulfonic acid functional groups segment includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups. It is further noted that the polymer may include a sulfonyl fluoride group (figure 3 and accompanying text.) The material is commonly known as Nafion, which has an equivalent weight of 400-1600, (see example 2 for a weight of 950.) As the materials of the reference and the instant invention are equivalent, the modulus of elasticity of the materials will be the same. Thus, the claims are anticipated.

Claims 30-36 and 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Cisar (US 5,635,039.)

Cisar (US 5,635,039) teaches a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups. The material is defined to be Nafion, which has the following structure:



One segment block contains polytetrafluoroethylene groups (PTFE) and another segment block contains perfluorovinyl ester with sulfonic acid functional groups. The crystalline melting point is over 300 C. The perfluorovinyl ester with sulfonic acid functional groups segment includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups. It is further noted that the polymer may include a sulfonyl fluoride group (col. 13, lines 7-17.) The material is commonly known as Nafion, which has an equivalent weight of 400-1600, (see col. 7, lines 45-end for a weight of 1100.) As the materials of the reference and the instant invention are equivalent, the modulus of elasticity of the materials will be the same. Thus, the claims are anticipated.

### ***Response to Arguments***

Applicant's arguments filed 6/60/2005 have been fully considered but they are not persuasive.

Rejection under 35 U.S.C. 112. The applicant argues that the amendment to claim 30 distinguishes chain segment B from the polymer unit (b) in the claimed multi-segmented

Art Unit: 1745

fluoropolymer material. This added limitation does not overcome the rejection as chain segment B is a fluoropolymer chain containing no sulfonic acid functional groups and unit (b) is at least one type of ethylenic fluoromonomer unit containing no sulfonic acid functional groups. These units are indistinguishable as they can be the same. The applicant argues that the newly added limitation that the melting point or the glass transition point of segment B is 100 C or higher further defined segment B, however, there is nothing in the claims that limits unit (b) to have properties that are different than these. The applicant argues that the unit (b) will be shorter in length, etc. and will not have these properties, however, this is not persuasive, as the claims do not reflect these differences. With regard to the applicant's arguments based on the mechanical strength of the polymer, as the segment and the unit are indistinguishable, each will provide the same properties. These claims stand rejected as being indefinite as it is not clear in the polymer where one block begins and ends as the segments and units are indistinguishable. As the claimed segments encompass a large number of possible units and segments that are not specifically defined, it is not clear what will comprise each separate unit A and B. Further, the applicant uses the transitional phrase, "comprising" in the claim, which allows for various other possible units in the polymer. Thus, the claims are indefinite.

Rejections based on 35 U.S.C. 102. The applicant argues that the claimed multi-segmented fluoropolymer of the present invention will be understood by one of ordinary skill in the art to be a fluoropolymer comprised of discrete segments in the form either blocks or grafts or a combination thereof. Further, one of ordinary skill in the art would understand that each block or segment is of a significant size relative to the individual constitutional units. The applicant then cites a passage from the reference:

"The composite membranes fabricated by the methods of the invention may comprise randomly blended polymers as well as alternating blocks, each block comprising essentially one particular polymer. For example, a composite membrane may be fabricated by forming, within each molecule, regions of pure PTFE and regions of low equivalent weight copolymer. The pure PTFE regions may crystallize to form a reinforcing matrix, while the low equivalent weight regions may furnish high proton conductivity paths. The methods of the invention comprise extruding and processing a polymer-block type composite membrane using the same techniques that may be used in fabricating a conventional random polymer membrane."

The applicant then concludes that the multi-segmented fluoropolymers taught in the Cisar references are not block copolymers. These arguments are not persuasive. The reference clearly states that membrane may be blended as well as alternating blocks of each type of segment described. The polymer may include regions of pure PTFE and regions of the proton conductive region having sulfonic acid functional groups. The material is referred to as a polymer block-type as compared with a random polymer. Further, the reference defines the PTFE segment to provide a reinforcing matrix and the proton conductive sulfonic acid region as a high proton conductive region (see col. 7, line 15 to col. 8, line 15.) These regions are equivalent to those in applicant's claimed invention. The reference clearly states that the material may be either a blend of the polymer units or a block copolymer comprising both units. Thus, the claims stand rejected over the applied references.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**



Art Unit: 1745

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Examiner Correspondence***

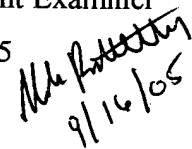
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745



9/16/05